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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/620,041 | 07/15/2003 | Robert L. Horton | 11836.740.NP | 7482 |
| 26722 | 7590 | 05/13/2005 | EXAMINER | |
| OSHA LIANG/MI ONE HOUSTON CENTER SUITE 2800 HOUSTON, TX 77010 | | | RICHARD, CHARLES R | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1712 | |

DATE MAILED: 05/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/620,041 | Applicant(s) HORTON ET AL. | |
| | Examiner C. R. Richard | Art Unit 1712 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 14-36 is/are rejected.
- 7) ☒ Claim(s) 3,9-13 and 25 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>12/31/03</u> . | 6) <input type="checkbox"/> Other: ____. |

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DETAILED ACTION

1. The term "surfactant functional group" is employed throughout the specification and claims to refer to the hydrophilic part of a surfactant. While the Applicant may be his own lexicographer, it is not recommended to use standard terminology in a non-standard way as this may cause confusion in the minds of the public as to what Applicant is claiming as his invention (assuming claims later issue in a patent). Surfactants usually have two parts, one hydrophobic and one hydrophilic, so on the face of things, Applicants use of the term to refer to one part only may be confusing to someone not making a detailed study of the specification. It is clear however that Applicant intends this term to refer to the hydrophilic part of a surfactant only, and this application will be examined with this definition in mind.

2. It is also of note that the claims (at least for the most part) have at least one product by process limitation relating to the formation of the hydrophobic backbone in the polymer/oligomer. This makes only a comparison of resulting compounds and the prior art necessary for purposes of examination. That is, the process of a product by process claim does not in itself distinguish its product for purposes of patentability and insufficient evidence has been presented by Applicant to show otherwise. As the Federal circuit has explained:

[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

[Applicant] argues that even if the performance of a compound is comparable to that of the prior art, this fact does not necessarily imply that the structures are identical. We agree. We also agree that on the

entirety of the record the PTO had correctly adduced a prima facie case, and that the burden had shifted to [Applicant], "to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product." *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985) (*internal citations omitted*.)

3. Note that in the dictionary consulted by the Examiner, the term "poly" means more than one, so for purposes of examination, a disclosure of an oligomer (which is at least two monomers) is sufficient for a polymer also.

4. Applicant claims benefit of US Provisional Application No. 60/319575 filed September 25, 2002 and has incorporated this document by reference into the present application. The Examiner concludes from his review of the priority application that claims 15-32 of the present application are not supported in the priority application and will evaluate prior art in relation to these claims according to this finding; no corresponding statement is made as to the other claims at this time.

Oath/Declaration

5. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective, because it was not executed in accordance with either 37 CFR 1.66 or 1.68. The blank for the date next to the signature of one of the inventors, Kamila B. Abdur-Rahman, was not filled in.

Specification

6. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are at page 9, lines 7-28 and page 12, line 29 to page 13, line 3. There are many similar instances as well.

In the first instance cited (at page 9), Applicant shows a substituent, S1, in group R9, yet does not define S1. Further, Applicant indicates that in the structure shown, w = 1 to 12, yet there is no w shown in the structure, nor could the Examiner find w further defined anywhere in the specification. In addition, this instance is the fourth in a series in the specification that show R7 and its glycol functional group and R9 with its amine group (where there is a positive charge on the nitrogen regardless of the choice of H or methyl for R11 and R12), yet there is mention here of (only) nonionic surfactant character and either (only) zwitterionic, cationic or anionic character in the others in the series. It may even be argued that the members of this series actually describe one and the same material. Note there are similar issues in the series of disclosures for the corresponding polymers where there are carbon-carbon double bonds in the backbone.

In the second instance cited (at page 12-13), Applicant describes a structure as being in acid form when it is clearly not the case, since the carboxyl group is shown as carboxylate ion.

Applicant is reminded that correction of such errors may invoke a later rejection for addition of new matter depending on how such correction is attempted. In some instances, the most appropriate correction may be to strike the offending material.

Claim Objections

7. Claim 3 is objected to because of the following informalities: the claim recites "acid form" and shows a structure containing a carboxylate ion (-COO^-) instead of a carboxyl group (-COOH). Appropriate correction is required.

8. Claim 9 is objected to because of the following informalities: the claim recites "molecular confirmation" when "molecular conformation" is called for instead. Appropriate correction is required.

9. The claim following claim 25 is misnumbered as claim 28 and has been renumbered as claim 26 per 37 CFR 1.126.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 15-18, 21-26 and 28-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims provide no definition for S1 shown in the structure in the claim and/or define a numerical range for the parameter, w, but do not show it in the structure in the claim. The specification does not provide clarification as to either issue as has been previously mentioned, as there, S1 is shown, but not always defined, and the parameter, w, is given numerical ranges but never further explained or associated with anything.

For purposes of speeding prosecution, these claims will be examined on the merits ignoring the w parameter and assuming that S1 is either -COO^- or -SO_3^- . This will not preclude later rejections for new matter and the like depending on how Applicant responds to the present rejection, however.

12. Claim 34 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the recitation of "conventional surfactants" makes the claim unclear, in the sense that it is uncertain what surfactants are possible "conventional surfactants". Applicant does define these "conventional surfactants" as (1) non-viscoelastic or (2) non-viscoelastic and viscoelastic in nature on page 28, lines 4-5 of the specification; this definition is less than instructive, especially considering that Applicant has included a very large variety of surfactants in the realm of viscoelastic surfactants already (see claim 14 for instance). Unless there is further (and

sufficiently clarifying) explanation of this term somewhere in the specification that Applicant can point to, it may be necessary for Applicant to strike this phrase from the rejected claim.

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. Claims 1, 9, 14 and 35-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Borchardt et al. in US Patent 4,409,110. Borchardt teaches an aqueous solution of mixtures of polymer viscosifiers and other polymers (see column 1, lines 5-9) useful in the enhanced recovery of hydrocarbons. The viscosifier may be a polyacrylamide (see column 6, lines 61-68) that Applicant admits is a viscoelastic surfactant (see claim 14 for instance). The other polymer may be from a class of cationic polymers (at least when acidified) having repeating units of the formula $R1(Z^+(R2R3R4))_nX_m^-$, wherein R1 is part of the polymer backbone and may be C2-C40 alkylene or alkenylene; Z may be nitrogen; R2, R3 and R4 may be independently C1-

C40 alkyl with a carboxyl substituent possible; n is such that the polymer molecular weight is from about 800 to 6 million; X is a counter ion; and m being such that the charges balance; the pendent linkage between R1 and Z may be a direct bond or a branch of several [carbon] atoms (see column 9, lines 20-45 and column 10, lines 35-60).

As to claims 35 and 36 in particular, the fluids of Brochardt may be used as drilling fluids and in fluid loss prevention (see column 5, lines 28-42 and lines 60-66). The steps in these claims are inherent/implied in this disclosure; that is, one of ordinary skill in the art would instantly envision these steps upon reading the disclosure.

15. Claims 9, 15, 17, 19 and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by disclosures in document WO 02/11874. This document discloses a viscoelastic wellbore treatment fluid comprising oligomeric surfactants which may be used in drilling, completion, fracturing and other oil field operations (see page 1, lines 1-13). Applicant should note that the priority document asserted by Applicant does not support the rejected claims as was discussed above, so the cited reference may be properly applied against these claims under 35 USC 102(b).

The oligomer may be based on linked surfactant monomer subunits of the formula R1-Y wherein R1 may be a C10-C50 aliphatic hydrocarbyl [alkyl, alkenyl or alkynyl] tail group and Y may be a zwitterion polar head group like $-N^+(CH_3)_2-CH_3-COO^-$ (see page 8, lines 12-22); the monomers may be linked tail to tail (see page 5, lines 9-27). These oligomers are useful as wellbore thickening agents (see page 7, lines 6-8).

Salts of oleic acid are another variety of suitable monomer (see page 8, line 35 to page 9, line 1).

These treatment fluids may further comprise an effective amount of monomeric surfactant for controlling the viscoelasticity of the fluid (see page 9, lines 22-24); such monomers (and the corresponding oligomers) being viscoelastic as verified by the Applicants admission in claim 14 (listing zwitterion, carboxylic acid and quaternary surfactants as viscoelastic). Inorganic salt solutions such as KCl brine (which contain water) may be added (see page 10, line 34 to page 11, line 4). These fluids may be aqueous based (see page 7, lines 6-15).

WO 02/11874 teaches materials encompassed by the rejected claims such as where (in the claim), z and x are zero, R5 and R6 are H, y is 8 (see WO 02/11874 at page 5, lines 9-16, defining oligomer with 2 to 8 subunits), v is 8 (corresponding to R1 of C10 alkenyl in the reference), R11 and R12 are methyl and S1 is CO₂⁻.

16. Claims 1-2, 5, 7, 9, 14-15, 17, 19, 21, 33 and 35 are rejected under 35 U.S.C. 102(e) as being anticipated by Hughes et al. in US Patent Application Publication No. 2004/0067855; this is the US equivalent of WO 02/11874 cited above. Hughes discloses a viscoelastic wellbore treatment fluid comprising oligomeric surfactants which may be used in drilling, completion, fracturing and other oil field operations (see page 1, paragraphs 1 and 2).

The oligomer may be based on linked surfactant monomer subunits of the formula R1-Y wherein R1 may be a C10-C50 aliphatic hydrocarbyl [alkyl, alkenyl or

alkynyl] tail group and Y may be a zwitterion polar head group like $-N^+(CH_3)_2-CH_2-COO^-$ (see page 3, paragraph 36); the monomers may be linked tail to tail (see page 2, paragraph 25). These oligomers are useful as wellbore thickening agents (see page 2, paragraph 32). Salts of oleic acid are another variety of suitable monomer (see page 3, paragraph 38).

These treatment fluids may further comprise an effective amount of monomeric surfactant for controlling the viscoelasticity of the fluid (see page 3, paragraph 41); such monomers (and the corresponding oligomers) being viscoelastic as verified by the Applicants admission in claim 14 (listing zwitterion, carboxylic acid and quaternary surfactants as viscoelastic). Inorganic salt solutions such as KCl brine (which contain water) may be added (see page 3, paragraph 46). These fluids may be aqueous based (see page 2, paragraph 32).

As to claim 19 in particular (and claims 15,17 and 21 correspondingly) , Hughes teaches materials encompassed by this claim such as where (in the claims), z and x are zero, R5 and R6 are H, y is 8 (see Hughes at page 2, paragraph 25, defining oligomer with 2 to 8 subunits), v is 8 (corresponding to Hughes' R1 of C10 alkenyl), R11 and R12 are methyl and S1 is CO_2^- .

As to claim 33 in particular, the step recited (and there is no specific order relating to components given) is inherently/impliedly disclosed by (for example) a composition as called out in the reference being aqueous based and containing a viscoelastic monomer, KCL brine and an oligomeric thickener (see above).

As to claim 35 in particular, the composition may be used in drilling (see above), the steps being inherently/impliedly disclosed.

17. Claims 1-2, 9, 14, 33, and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Di Lullo et al. in US Patent No. 6,767,869.

Di Lullo teaches a well fracturing fluid comprising a liquid carrier (which may be water or mostly water), a surfactant (which may be a viscoelastic surfactant, especially anionic) and an amphoteric polymer (such as such as a terpolymer made from acrylic acid, acrylamide and dimethyl diallyl ammonium chloride) (see column 6, lines 40-48 and lines 63-65, as well as column 8, lines 25-47). The fluid can further comprise one or more additives such as NaCl or KCl among other water soluble inorganic salts (see column 8, lines 48-60).

As to claim 33, the blending is inherently/impliedly disclosed in the calling out of the composition in the reference as in the previous rejection of the claim.

As to claim 36, the fluid of Di Lullo would inherently prevent fluid loss.

18. Claims 1-2, 9, 14 and 33 are rejected under 35 U.S.C. 102(e) as being anticipated by disclosures in WO 02/064947. This reference teaches an aqueous viscoelastic fluid for use in recovery of hydrocarbons from downhole (see Abstract).

The aqueous fluid taught in this reference contains a surfactant (which happens to be viscoelastic) that may be an oligomer of monomers bonded tail to tail, where the monomer has a hydrocarbon tail (which may be partially saturated) attached through

other groups to a hydrophilic head (which may be caboxylate, sulfonate or quaternary ammonium) (see pages 8-10). In addition, the aqueous fluid may contain salts such as ammonium, sodium or potassium chloride or sodium salicylate (see page 12). Note that the oligomer is also viscoelastic (so satisfies two requirements in the rejected claims at the same time) and the sodium salicylate that may be part of the fluid is arguably also viscoelastic given the admission of Applicant in claim 14.

19. Claims 1-2, 9, 14 and 31-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Davies et al. in US Patent No. 6,433,075. Davies teaches a surfactant based gelling composition for well bore service fluids.

Example 1 of Davies shows a polymerization of N-erucyl-N,N-bis(2-hydroxyethyl)-N-methylammonium chloride in an aqueous solution of ammonium chloride. The monomer and polymer are both viscoelastic.

Example 2 of Davies shows a polymerization of potassium oleate in a KCl electrolyte solution. The monomer and the polymer are both viscoelastic.

As to claims 31-32, the polymers of Davies can be crosslinked using inorganic ions, ionic complexes or polar organic molecules (see column 3, lines 22-23). Carboxylated polymers can be crosslinked using polyvalent metal ions such as chromium(III) or zirconium(IV) ions (see column 3, lines 22-27). Formaldehyde may be used in some cases (see column 5, lines 34-36).

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

21. Claims 1, 3-8, 9, 15-32 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borchardt et al. in US Patent 4,409,110, especially in view of Hughes et al. in US Patent Application Publication No. 2004/0067855 or the foreign equivalent of Hughes, document WO 02/11874, or in the case of claims 31-32, in view of Davies et al. in US Patent No. 6,433,075. Borchardt, Hughes, WO 02/11874 and Davies have been discussed in detail previously.

As to most (if not all) of the rejected claims, it may be of note that Applicant makes no showing as to the relative desirability of the polymers recited in these claims versus any similar ones.

As to claims 3, 4, 6 and 8 in particular, Borchardt discloses all the elements of these claims, except it does not specifically disclose the surfactant-polymer required,

but the polymer is within a genus described by Borchardt (see column 9, lines 20-45 and column 10, lines 35-60). The following choices of parameters in Borchardt (among others) produce the required polymers: R1=C7 alkylene, Z=nitrogen, R2 and R3 = methyl, R4 = methylene carboxyl and n=3. One of ordinary skill in the art considering the disclosures of Borchardt would have been motivated to perform the routine experiments necessary to obtain the optimal polymers in the genus disclosed by Borchardt, and given the rather common nature of the choices in parameters needed to produce the polymers of the rejected claims (see for example the polar head group – $N^+(CH_3)_2-CH_3-COO^-$ at page 3, paragraph 36 of Hughes or at page 8, lines 12-22 of WO 02/11874) and that many of the choices involve mere selection in an homologous series (which requires very little thought), the skilled artisan would have made these polymers (in either acid or salt form as required by the rejected claims) and from these, compositions of the rejected claims. Claims 3, 4, 6 and 8 are obvious over Borchardt (especially in view of Hughes and WO 02/11874).

As to claims 5 and 7 in particular, Borchardt discloses all the elements of these claims, except it does not specifically disclose the surfactant-polymer required, but such polymers are within the genus described by Borchardt just mentioned. The same or even a less specific set of choices for the parameters in Borchardt are required to obtain the polymers of the claims 5 and 7 versus those for claims 3, 4, 6 and 8 as just discussed.

As to claim 19-20 in particular (and 15-18 & 21-22 correspondingly), Borchardt discloses all the elements of these claims, except it does not specifically disclose the

surfactant-polymer required, but such polymers are within the genus described by Borchardt just mentioned. The following choices of parameters in Borchardt (among others) produce polymers as in claim 19: $R1=C7$ alkylene, $Z=\text{nitrogen}$, $R2$ and $R3 = \text{methyl}$, $R4 = \text{methylene carboxyl}$ and $n=3$. This corresponds to z and $x=0$, $R5$ and $R6=H$, $y=3$, $v=5$, $R11$ and $R12=\text{methyl}$ and $S1=CO_2^-$ in claim 19. The choices here for Borchardt are the same as given above in the rejection of claims 3, 4, 6 and 8; thus, the motivation of one of ordinary skill in the art to choose them is the same as there and claim 19 is obvious over Borchardt in the same manner. Claim 20 requires only working up a homologous series (from the $v=5$ above to $v=12$ to 18); $v=12$ to 18 in the claim corresponds to $R1$ in Borchardt of $C14$ to $C20$ which is well within the range disclosed of $C2$ to $C40$ (see column 10, lines 35-60 of Borchardt). Claims 15-18 & 21-22 correspondingly are obvious over Borchardt.

As to claim 27 in particular, this claim is obvious over Borchardt following the reasoning of the rejection of claim 19 just made, except with $R1=C7$ alkenylene in Borchardt and $v=3$ in the claim. Claim 28 is obvious for reasons corresponding to those given for claim 20. Claims 27-28 (and 23-26 & 29-30 correspondingly) are obvious over Borchardt.

As to claims 31-32 in particular, Borchardt discloses compositions with all the elements of these claims, except for the crosslinking. Davies discloses crosslinking of viscoelastic, carboxylated polymers similar to those of Borchardt that are used in a similar context (see rejections over Davies and Borchardt above). Such crosslinking can

be via chromium(III) or zirconium(IV) ions (see column 3, lines 22-27 of Davies as previously discussed) as in the rejected claims.

One of ordinary skill in the art would have been motivated to combine the teachings of Borchardt with that of the crosslinking in Davies in order to obtain the advantage of increased gel strength and reduction of gel environmental sensitivity taught by Davies (see Davies column 5, lines 15-18) and thus would obtain the compositions of the rejected claims. Thus, claims 31-32 are obvious over the cited references.

As to claims 35 and 36 in particular, the fluids of Borchardt may be used as drilling fluids and in fluid loss prevention (see column 5, lines 28-42 and lines 60-66 in Borchardt). The simple steps involved in the rejected claims are implied by this description of the use of the fluids disclosed, and in any case, the (generic) steps themselves are notoriously well known in the art of drilling (claim 35) and fluid loss prevention (claim 36). One of ordinary skill in the art would thus have been motivated by these teachings (especially in combination with common knowledge in the art) to make the invention of the rejected claims.

22. Claims 9 and 15-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 02/11874 and in the case of claims 31-32, in view of Davies et al. in US Patent No. 6,433,075. WO 02/11874 and Davies have been discussed in detail previously.

It may be of note as to most (if not all) of the rejected claims, that Applicant makes no showing as to the relative desirability of the polymers recited in these claims versus any similar ones.

As to claim 19-20 in particular (and 15-18 & 21-22 correspondingly), WO 02/11874 discloses all the elements of these claims, except it does not specifically disclose the surfactant-polymer required, but such polymers are within a genus described. WO 02/11874 teaches R1-Y based oligomers, for example, where R1 is a C10 aliphatic hydrocarbyl [alkyl, alkenyl or alkynyl] tail group and Y is a zwitterion polar head group $-N^+(CH_3)_2-CH_3-COO^-$ (see page 8, lines 12-22), and the monomers are linked tail to tail (see page 5, lines 9-27). This corresponds to oligomers encompassed by claim 19 where, z and x are zero, R5 and R6 are H, y is 8 (see WO 02/11874 at page 5, lines 9-16, defining oligomer with 2 to 8 subunits), v is 8, R11 and R12 are methyl and S1 is CO_2^- . One of ordinary skill in the art would have been motivated to make this selection of parameters in WO 02/11874 (this is not an especially difficult selection to make given the form of the WO 02/11874 disclosure cited) in the course of obtaining optimal polymers and would have obtained the required polymers and hence the compositions of claim 19. Claim 20 requires only working up a homologous series (from the v=8 above to v=12 to 18); v=12 to 18 in the claim corresponds to R1 in WO 02/11874 of C14 to C20 which is well within the range disclosed of C10 to C50 (see page 8, lines 18-19 of WO 02/11874). Claims 15-18 & 21-22 correspondingly are obvious over WO 02/11874.

As to claim 27 in particular, this claim is obvious over WO 02/11874 following the reasoning of the rejection of claim 19 just made, except $R1=C10$ alknyl (before linking) in the reference and $v=6$ in the claim. Claim 28 is obvious using reasoning corresponding to that used for claim 20. Claims 27-28 (and 23-26 & 29-30 correspondingly) are obvious over WO 02/11874.

As to claims 31-32 in particular, WO 02/11874 discloses compositions with all the elements of these claims, except for the crosslinking. Davies discloses crosslinking of viscoelastic, carboxylated polymers similar to those of WO 02/11874 that are used in a similar context (see rejections over Davies and WO 02/11874 above). Such crosslinking can be via chromium(III) or zirconium(IV) ions (see column 3, lines 22-27 of Davies as previously discussed) as in the rejected claims.

One of ordinary skill in the art would have been motivated to combine the teachings of WO 02/11874 with that of the crosslinking in Davies in order to obtain the advantage of increased gel strength and reduction of gel environmental sensitivity taught by Davies (see Davies column 5, lines 15-18) and thus would obtain the compositions of the rejected claims. Thus, claims 31-32 are obvious over the cited references.

23. Claims 1, 5, 7, 9, 15-33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. in US Patent Application Publication No. 2004/0067855 (the US equivalent of WO 02/11874) and in the case of claims 31-32, in view of Davies

et al. in US Patent No. 6,433,075. Hughes and Davies have been discussed in detail previously.

It may be of note that as to most (if not all) of the rejected claims, Applicant makes no showing as to the relative desirability of the polymers recited in these claims versus any similar ones.

As to claims 5 and 7 in particular, Hughes discloses all the elements of these claims, except it does not specifically disclose the genus of surfactant-polymer required, but such polymers are a subgenus of the R1-Y based genus described by Hughes (at page 3, paragraph 36), and polymers of the claims can be found in the Hughes genus where, for example, where R1 is a C10-C50 aliphatic hydrocarbyl [alkyl, alkenyl or alkynyl] tail group and Y is a zwitterion polar head group $-N^+(CH_3)_2-CH_3-COO^-$ (see page 3, paragraph 36 of Hughes) and the monomers are linked tail to tail (see page 2, paragraph 25). One of ordinary skill in the art would have been motivated to make this selection of parameters in Hughes (this is not a very detailed or particular selection given the Hughes disclosure cited) in the course of obtaining optimal polymers and would have obtained the required polymers and hence the compositions of the rejected claims. Claims 5 and 7 are obvious over Hughes.

As to claims 19-20 in particular (and 15-18 & 21-22 correspondingly), Hughes discloses all the elements of these claims, except it does not specifically disclose the surfactant-polymer required, but such polymers are within a genus described by Hughes. Hughes teaches R1-Y based oligomers, for example, where R1 is a C10 aliphatic hydrocarbyl [alkyl, alkenyl or alkynyl] tail group and Y is a zwitterion polar head

group $-N^+(CH_3)_2-CH_3-COO^-$ (see page 3, paragraph 36 of Hughes) and the monomers are linked tail to tail (see page 2, paragraph 25 of Hughes). This corresponds to oligomers encompassed by claim 19 where, z and x are zero, R5 and R6 are H, y is 8 (see Hughes at page 2, paragraph 25, defining oligomer with 2 to 8 subunits), v is 8, R11 and R12 are methyl and S1 is CO_2^- . One of ordinary skill in the art would have been motivated to make this selection of parameters in Hughes (this is not an especially difficult selection to make given the form of the Hughes disclosure cited) in the course of obtaining optimal polymers and would have obtained the required polymers and hence the compositions of claim 19. Claim 20 requires only working up a homologous series (from the v=8 above to v=12 to 18); v=12 to 18 in the claim corresponds to R1 in Hughes of C14 to C20 which is well within the range disclosed of C10 to C50 (see page 3, paragraph 36 of Hughes). Claims 15-18 & 21-22 correspondingly are obvious over Hughes.

As to claim 27 in particular, this claim is obvious over Hughes following the reasoning of the rejection of claim 19 just made, except R1=C10 alknyl (before linking) in Hughes and v=6 in the claim. Claim 28 is obvious using reasoning corresponding to that employed in the rejection of claim 20. Claims 27-28 (and 23-26 & 29-30 correspondingly) are obvious over Hughes.

As to claims 31-32 in particular, Hughes discloses compositions with all the elements of these claims, except for the crosslinking. Davies discloses crosslinking of viscoelastic, carboxylated polymers similar to those of Hughes that are used in a similar context (see rejections over Davies and Hughes above). Such crosslinking can be via

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chromium(III) or zirconium(IV) ions (see column 3, lines 22-27 of Davies as previously discussed) as in the rejected claims.

One of ordinary skill in the art would have been motivated to combine the teachings of Hughes with that of the crosslinking in Davies in order to obtain the advantage of increased gel strength and reduction of gel environmental sensitivity taught by Davies (see Davies column 5, lines 15-18) and thus would obtain the compositions of the rejected claims. Thus, claims 31-32 are obvious over the cited references.

As to claim 33 in particular, the step called out, especially since there is no specific order relating to components involved, is inherently/impliedly taught by or would immediately be called to mind by one of ordinary skill in the art from a disclosure of (for example) a composition as called out in Hughes being aqueous based and containing a viscoelastic monomer, KCL brine and an oligomeric thickener (see above rejections over Hughes under 35 USC 102).

As to claim 35 in particular, the fluids of Hughes may be used as drilling fluids (see page 1, paragraphs 1 and 2 of Hughes). The simple steps involved in the rejected claim are implied by this description of the use of the fluids disclosed, and in any case, the (generic) steps themselves are notoriously well known in the art of drilling. One of ordinary skill in the art would thus have been motivated by these teachings (especially in combination with common knowledge in the art) to make the invention of the rejected claim.

Allowable Subject Matter

24. Claims 10-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Samour et al. in US Patent 4,064,091 discloses compositions containing quaternary ammonium polymers and otherwise similar to those of the present invention.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to C. R. Richard whose telephone number is 571-272-8502. The examiner can normally be reached on M-F, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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CR Richard


PHILIP TUCKER
PRIMARY EXAMINER
ART UNIT 1712